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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/671,935	09/29/2003	Fred Gehrung Gustavson	YOR920030330US1	8289
48150	7590	10/04/2007	EXAMINER	
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SUITE 200				
VIENNA, VA 22182-3817				
			ART UNIT	PAPER NUMBER
			2193	
			MAIL DATE	DELIVERY MODE
			10/04/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary	Application No.	Applicant(s)	
	10/671,935	GUSTAVSON ET AL.	
	Examiner	Art Unit	
	Chat C. Do	2193	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07/16/2007; 6/19/2007; and 08/08/07.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>6/19/07; 7/31/07; 8/8/07</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. This communication is responsive to Amendment filed 07/16/2007.
2. Claims 1-20 are pending in this application. Claims 1, 7, 13, and 19 are independent claims. This Office Action is made final.

Claim Rejections - 35 USC § 101

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 1-20 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claims 1-20 cite a method, apparatus, and medium for executing a linear algebra subroutine in computer in accordance with a mathematical algorithm. In order for claims to be statutory, claims must either include a practical/physical application or a concrete, useful, and tangible result. However, claims 1-20 merely disclose steps/components for executing a linear algebra subroutine without further disclosing a practical/physical application or a useful and tangible result. In addition, claims 13-18 as program software resides on non-tangible medium as clearly stated in page 24 lines 10-15. Therefore, claims 1-20 are directed to non-statutory subject matter.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1, 6-7, 12-13, and 18 are rejected under 35 U.S.C. 102(b) as being anticipated by Fred et al. (“Superscalar GEMM-based Level 3 BLAS – The On-going Evolution of a Portable and High-Performance Library”).

Re claim 1, Fred et al. disclose a method of improving at least one of speed and efficiency when executing a level 3 dense linear algebra processing on a computer (e.g. abstract and first four lines under the introduction section in page 207), said method comprising: automatically setting an optimal machine state on said computer for said processing (e.g. first paragraph in page 208, and section 2 in page 208 wherein the automation is done by the kernel level; page 211 the first two paragraph) by selecting an optimal matrix subroutine from among a plurality of matrix subroutines stored in a memory (e.g. section 3 in pages 208-209 and section 3.2 in pages 210-211 wherein as an instant the DGEMM routine is optimal from all the routines in page 210) that could alternatively perform a level 3 matrix multiplication processing (e.g. first four lines under the introduction section in page 207).

Re claim 6, Fred et al. further disclose plurality of matrix subroutines comprises six possible matrix subroutines that could alternatively be used for level 3 matrix multiplication processing (e.g. abstract and the first four lines under the introduction

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section in page 207 and section 3.2 the sixth subroutine is the optimal DGEMM in pages 210-211).

Re claim 7, it is an apparatus claim having similar limitations cited in claim 1. Thus, claim 7 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 12, it is an apparatus claim having similar limitations cited in claim 6. Thus, claim 12 is also rejected under the same rationale as cited in the rejection of rejected claim 6.

Re claim 13, it is a machine-readable storage medium claim having similar limitations cited in claim 1. Thus, claim 13 is also rejected under the same rationale as cited in the rejection of rejected claim 1.

Re claim 18, it is a machine-readable storage medium claim having similar limitations cited in claim 6. Thus, claim 18 is also rejected under the same rationale as cited in the rejection of rejected claim 6.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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8. Claims 3-4, 9-10, and 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fred et al. ("Superscalar GEMM-based Level 3 BLAS – The On-going Evolution of a Portable and High-Performance Library") in view of Pingali et al. (U.S. 6,357,041).

Re claims 3-4, Fred et al. fail to disclose matrix subroutine comprises a substitute of a subroutine from a LAPACK (Linear Algebra PACKage), which comprises a BLAS Level 3 L1 cache kernel. However, Pingali et al. disclose in Figures 1-4 matrix subroutine comprises a substitute of a subroutine from a LAPACK (Linear Algebra PACKage), which comprises a BLAS Level 3 L1 cache kernel (e.g. col. 4 line 54 to col. 5 line 14 wherein the subroutine in standard LAPACK is not optimal for execution).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to replace the routine as a substitute of a subroutine from a LAPACK (Linear Algebra PACKage), which comprises a BLAS Level 3 L1 cache kernel as seen in Pingali et al.'s invention into Fred et al.'s invention because it would enable to enhance data reuse and speed (e.g. col. 2 line 57 to col. 3 line 35).

Re claim 9, it is an apparatus claim having similar limitations cited in claim 3. Thus, claim 9 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 10, it is an apparatus claim having similar limitations cited in claim 4. Thus, claim 10 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

Re claim 15, it is a machine-readable storage medium claim having similar limitations cited in claim 3. Thus, claim 15 is also rejected under the same rationale as cited in the rejection of rejected claim 3.

Re claim 16, it is a machine-readable storage medium claim having similar limitations cited in claim 4. Thus, claim 16 is also rejected under the same rationale as cited in the rejection of rejected claim 4.

9. Claims 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fred et al. ("Superscalar GEMM-based Level 3 BLAS – The On-going Evolution of a Portable and High-Performance Library") in view of Philip et al. ("PLAPACK: Parallel Linear Algebra Package Design Overview").

Re claim 19, Fred et al. disclose a method of providing a service involving at least one of solving and applying a scientific/engineering problem (e.g. section 1 introduction section in page 207), said method comprising at least one of: using a linear algebra software package that improves at least one of speed and efficiency to perform one or more matrix processing operations (e.g. abstract and the first four lines under the introduction section in page 207), wherein said linear algebra software package achieves the improved speed or efficiency by selecting an optimal matrix subroutine from among a plurality of matrix subroutines that alternatively can perform a matrix multiplication processing (e.g. section 2 and section 32), thereby automatically setting a computer into an optimal machine state for performing said matrix multiplication processing (e.g. pages

210-211) provide a consultation for solving a scientific/engineering problem using said linear algebra software package (e.g. output of result).

Fred et al. fail to disclose step of transmitting a result of said linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing said result, and a printed version representing said result; and receiving a result of said linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing said result, and a printed version representing said result. However, Philip et al. disclose step of transmitting a result of said linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing said result, and a printed version representing said result; and receiving a result of said linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing said result, and a printed version representing said result (e.g. abstract and page 1 under the introduction section wherein the library is distributed to network processors for processing).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add step of transmitting a result of said linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing said result, and a printed version representing said result; and receiving a result of said linear algebra software package on at least one of a network, a signal-bearing medium containing machine-readable data representing said result, and a printed version representing said result as seen in Philip et al.'s invention

into Fred et al.'s invention because it would enable to enhance computation (e.g. page 1 under the introduction section).

Re claim 20, Fred et al. disclose the BLAS Level 3 L1 cache kernel (e.g. abstract and introduction section in page 207). Fred et al. fail to disclose the BLAS routine from the LAPACK. However, Philip et al. disclose in the BLAS routine from the LAPACK (e.g. page 6). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to add the BLAS routine from the LAPACK as seen in Philip et al.'s invention into Fred et al.'s invention because it would enable to perform parallel dense linear algebra (e.g. introduction section in page 1).

Double Patenting

10. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

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11. Claims 1, 5-7, 11-13, and 17-18 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 21 and 22 of copending Application No. 10/671,934. Although the conflicting claims are not identical, they are not patentably distinct from each other because

Claims 21-22 of application No. 10/671,934 contain every element of claims 1, 5-7, 11-13, and 17-18 of the instant application and thus anticipate the claims of the instant application. Claims of the instant application therefore are not patently distinct from the earlier patent claims and as such are unpatentable over obvious-type double patenting. A later application claim is not patentably distinct from an earlier claim if the later claim is anticipated by the earlier claim.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

12. Claims 3-4, 9-10, and 15-16 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim 21 and 22 of copending Application No. 10/671,934 in view of Pingali et al. (U.S. 6,357,041).

Re claims 3-4, the copending Application fails to disclose the matrix subroutine comprises a substitute of a subroutine from LAPACK which further comprises a BLAS level 3 L1 cache kernel. However, Pingali et al. disclose the matrix subroutine comprises a substitute of a subroutine from LAPACK which further comprises a BLAS level 3 L1 cache kernel (e.g. col. 4 line 56 to col. 5 line 13). Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention is made to substitute a

subroutine from LAPACK which further comprises a BLAS level 3 L1 cache kernel as seen in Pingali et al.'s invention into the copending Application because it would enable to optimize performance by optimal routine (e.g. abstract).

Re claims 9-10, they are the apparatus claims having similar limitations cited in claims 3-4. Thus, claims 9-10 are also rejected under the same rationale as cited in the rejection of rejected claims 3-4.

Re claims 15-16, they are the machine-readable claims having similar limitations cited in claims 3-4. Thus, claims 15-16 are also rejected under the same rationale as cited in the rejection of rejected claims 3-4.

This is a provisional obviousness-type double patenting rejection.

"A later patent claim is not patentably distinct from an earlier patent claim if the later claim is obvious over, or **anticipated by**, the earlier claim. In re Longi, 759 F.2d at 896, 225 USPQ at 651 (affirming a holding of obviousness type double patenting because the claims at issue were obvious over claims in four prior art patents); In re Berg, 140 F.3d at 1437, 46 USPQ2d at 1233 (Fed. Cir. 1998) (affirming a holding of obviousness-type double patenting where a patent application claim to a genus is anticipated by a patent claim to a species within that genus). " ELI LILLY AND COMPANY v BARB LABORATORIES, INC., United States Court of Appeals for the Federal Circuit, ON PETITION FOR REHEARING EN BANC (DECIDED: May 30, 2001).

"Claim 12 and Claim 13 are generic to the species of invention covered by claim 3 of the patent. Thus, the generic invention is "**anticipated**" by the species of the patented invention. Cf., Titanium Metals Corp. v. Banner, 778 F.2d 775, 227 USPQ 773 (Fed. Cir. 1985) (holding that an earlier species disclosure in the prior art defeats any generic claim) 4. This court's predecessor has held that, without a terminal disclaimer, the species claims preclude issuance of the generic application. In re Van Ornum, 686 F.2d 937, 944, 214 USPQ 761, 767 (CCPA 1982); Schneller, 397 F.2d at 354. Accordingly, absent a terminal disclaimer, claims 12 and 13 were properly rejected under the doctrine of obviousness type double patenting." (In re Goodman (CA FC) 29 USPQ2d 2010 (12/3/1993).

Response to Arguments

13. Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

a. The applicant argues in pages 13-14 for claims rejected under 35 U.S.C. 101 that the current amended claims are directed to statutory subject matter which provide

concrete, useful, and tangible result as a method of improving speed/efficiency in performing a level 3 matrix multiplication.

The examiner respectfully submits that the claims do not explicitly disclose a practical application of the optimal subroutine to perform matrix multiplication.

Basically, the claims just disclose a method of selecting a subroutine from a set of subroutine to perform a matrix multiplication. The improvement of speed/efficiency would not constitute as concrete, useful, and tangible as required under 35 U.S.C. 101.

- b. The applicant also further argues in page 15 for claims that the computer readable medium is tangible as “tangibly embodying” for embodying the program.

The examiner respectfully submits that the claim language recites a machine-readable storage medium tangibly embodying the program but not as a tangible machine readable storage medium embodying the program as alleged by the applicant. Further, the specification page 24, lines 10-15 does suggest that the machine readable medium can be non-tangible medium such as digital and analog and communication links and wireless. Clearly, the machine readable storage medium claims are directed to non-tangible medium.

Conclusion

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chat C. Do whose telephone number is (571) 272-3721. The examiner can normally be reached on M => F from 7:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Chat C. Do
Examiner
Art Unit 2193

September 25, 2007

A handwritten signature in black ink, appearing to be 'Chat C. Do', with a stylized, flowing script.